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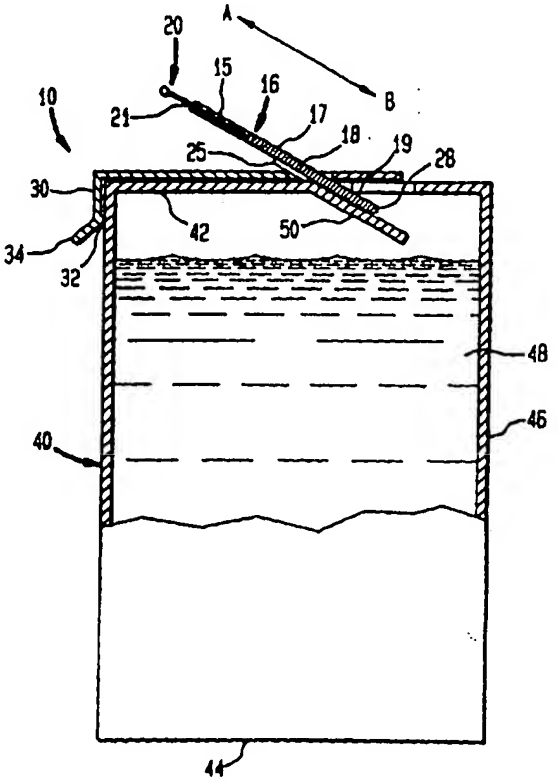
(57) Abstract

An apparatus (10) for opening a container (40) and for dispensing a substance (18) in a liquid beverage contained in a container (40) includes a flat portion (14) defining a wedge-shaped cut-out (12), side portions (30) extending downwardly from the flat portion (14), and an opening lever (16) attached to the flat portion (14). The opening lever (16) may include a receptacle (17) containing the substance (18) to be dispensed, a burstable material (28) covering one end of the opening lever (16), and a plunger (20) is pushed to compress the substance (18) and break the burstable material (28) to dispense the substance (18).



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APPARATUS FOR DISPENSING A SUBSTANCE

FIELD OF THE INVENTION

The present invention relates generally to beverage containers and, more specifically, to devices that open beverage containers and to devices that dispense a substance, such as medication, into a beverage or other liquid in the container.

BACKGROUND OF THE INVENTION

Various devices for dispensing a substance into a beverage container have been proposed. Some of these devices include a a separate chamber formed at the top of the beverage container to hold the substance to be dispensed, but do not include an integral mechanism for rupturing the chamber and for opening the container. See, for example, U.S. Patent No. 3,305,368 (Bourelle). Such devices are not arranged so that a user can choose to either rupture the chamber to dispense the substance or leave the chamber intact so that the beverage can be consumed without the substance.

Many other dispensing devices require a specially designed top that must be removably attached to the open top of a container. The top snaps onto an upwardly open beverage container, such as a cup. Some mechanism, such as a lever, or an operation, such as bending up the top, is used to release the substance into the container, then the top is removed in order to drink the beverage. For example, see U.S. Patent Nos. 3,326,363 (Bennett), 3,779,372 (de Lloret), 4,634,003 (Ueda),

4,785,931 (Weir), and 5,052,553 (DeSanctis). These devices, however, are not usable with existing cans that include a top.

None of these devices includes a chamber in the top of the container that is compatible with a separately manufactured substance dispenser. Nor do these devices comprise a snap-on top that is compatible with existing beverage containers.

SUMMARY OF THE INVENTION

It is therefore an important or principal object of the present invention to provide an apparatus that facilitates the dispensing of a substance in a liquid beverage contained in a beverage container, such as a soft drink can, and which is compatible with existing canning techniques and cans.

The foregoing object is achieved and the disadvantages of the devices discussed above are overcome by providing a container cap for a beverage container comprising a generally disc-shaped flat portion defining a cut-out, side portions extending downward from a peripheral edge thereof, and an opening lever attached to the flat portion proximate the cut-out. The container cap engages the top of the beverage container so that an end of the opening lever opposes a pour panel in the top of the container. This may be accomplished by providing the container cap with inward projections extending from an inner surface of the side portions of the cap which mate with the sidewall of the container. At least one projection is attached to a releasing lever that extends beyond a peripheral edge of the cap to facilitate removal of the cap. Alternatively, the cap may be

attached by frictional engagement, screw thread engagement on the cap, or similar types of joining a cap to a base.

The opening lever used in the present invention comprises a receptacle for containing a substance to be dispensed in a beverage contained in the beverage container and an opening end of the opening lever including a hole covered by a burstable material. Further, a hole is formed in a lifting end of the opening lever and a plunger is fitted in the hole. The opening lever is designed to dispense the contained substance to avoid splashing upon relesase. The burstable material may be covered with a protective wrap, that is easily detachable for removal prior to dispensing, to ensure cleanliness of the tip and to ensure that no tampering has occurred. The lever can extend in length beyond the edge of the cap. Further, the opening lever may be formed so as to define a gap between the underside of its lifting end and the upper surface of the flat portion of the container cap.

In another embodiment, the container cap comprises a cover including a flat portion and a depending circumferential portion. The flat portion defines a cut-out that can align with the pour panel formed in the top of a conventional soft drink can. The depending circumferential portion has inward projections for engaging the top portion of a container such as a soft drink or juice can. At least one of the inward projections is attached to a releasing lever to facilitate removal of the cap. The container cap has, on the underside of the circular flat portion, a tearable or burstable container, such as foil, attached with

an adhesive at a position that corresponds with the cut-out. The tearable or burstable container is supplied with medication or another additive normally suspended in a suitable liquid medium which will be dispensed in the liquid in the container. An opening lever attached to the top of the container cap acts as a dispenser by breaking through the burstable container when lifted. The opening lever may also act as a container opener by pushing open the pour panel of the container when the opening lever is further lifted and extends further downward through the cut-out of the flat portion. The opening lever includes a generally triangular shaped tip that facilitates dispensing the contained substance and can extend in length beyond the edge of the cap.

According to an operation of the present invention, the container cap is mounted on the top of the beverage container so that when the lifting end of the opening lever is lifted, the opening end of the opening lever moves downward to break open the pour panel in the top of the container, and the plunger is pushed to compress the substance contained in the receptacle to break the burstable material to dispense the substance in the beverage. The lever and the mechanism that attaches it to the container cap may be designed so as to provide a limited range of movement so that after opening the container, the lever may be translated in a direction away from the container pour panel to facilitate drinking of the beverage contained in the container.

As another embodiment of the present invention, the opening lever could be manufactured as an integral part of the can top when such top is produced, and not as part of a separate

container cap that is attached to the container.

According to another embodiment, an apparatus for dispensing a substance in a liquid beverage includes a cylindrical container with a non-resealable pour panel and a tab attached to a retain tab top end and a receptacle attached to an underside of a top of the container, wherein the receptacle contains the substance to be dispensed and includes an unbreakable side, an unbreakable top, and a thin, breakable bottom. The receptacle is angularly displaced from the pour panel and is burst open by lifting the tab. To aid in opening, an optional pin may be provided on an underside of the top of the receptacle, and an indicator on an exterior of the container may note when the receptacle has been ruptured.

In another aspect of the present invention, the receptacle opens upwardly to receive a substance dispenser containing a substance to be dispensed.

BRIEF DESCRIPTION OF THE DRAWINGS

Further objects, features and advantages of the invention will become apparent upon review of the following detailed description of the preferred embodiments, taken in conjunction with the following drawings, in which:

FIG. 1 is a top view partially broken away of a container cap according to the present invention;

FIG. 2 is a sectional view, taken in section along line 2-2 in FIG. 1, of a container cap including an ingredient dispenser according to a first embodiment of the present invention;

FIG. 3A is a sectional view, taken in section along line 2-2

in FIG. 1, of a container cap including an opening lever with a raised opening end;

FIG. 3B is a sectional view, taken in section along line 3-3 in FIG. 3A, of the container cap shown in FIG. 3A;

FIG. 4 is the sectional side view of FIG. 2 displaying the container cap attached to a container shown in partial sectional view and in an opened state;

FIG. 5 is a top view of a modified embodiment of the container cap of the present invention including an extended opening lever;

FIG. 6 is a bottom view of an opening lever according to a second embodiment of the present invention;

FIG. 7 is a side view of the opening lever shown in FIG. 6;

FIG. 8 is a sectional side view taken in section along line 2-2 in FIG. 1, incorporating the opening lever of FIG. 6, according to a second embodiment of the present invention;

FIG. 9 is a partial bottom view of the opening lever attached to the container cap as shown in FIG. 8;

FIG. 10 is a side view of a third embodiment of the present invention with the lever shown in sectional view and the container shown in partial sectional view;

FIG. 11 is a top view of a container cap according to a fourth embodiment of the present invention;

FIG. 12 is a sectional view, taken in section along line 12-12 in FIG. 11, of the fourth embodiment of the present invention;

FIG. 13 is a sectional view, taken in section along line 13-13 in FIG. 12, of the fourth embodiment of the present invention;

FIG. 14 is a top view of the container cap according to the

fourth embodiment including an extended opening lever;

FIG. 15 is an elevational view partially in section and partially broken away of a fifth embodiment of the present invention;

FIG. 16 is an elevational view partially in section and partially broken away of the fifth embodiment of the present invention as shown in FIG. 15 attached to a container;

FIG. 17 is a top view of the fifth embodiment of the present invention;

FIG. 18 is a top view of a beverage container incorporating the ingredient dispenser according to a sixth embodiment of the present invention;

FIG. 19 is a sectional view of a beverage container of FIG. 18 taken along line 19-19 of FIG. 18 including an ingredient dispenser according to the sixth embodiment of the present invention;

FIG. 20 is a top view of a beverage container according to a seventh embodiment of the present invention;

FIG. 21 is a sectional view taken along line 21-21 of FIG. 20 of a beverage container including a receptacle according to the seventh embodiment of the present invention; and

FIG. 22 is a perspective view of a substance dispenser for use in the seventh embodiment of the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The present invention relates to a device for opening the pour panel of a beverage container, which device may also incorporate a receptacle that contains a substance to be

dispensed in a liquid beverage contained in the container. The substance can be medication, including analgesics, or a flavoring agent, a sweetening agent or an alcoholic beverage, for example. The device can take the form of a snap-on container cap.

The present invention also relates to the configuration and operation of a separate receptacle that contains such a substance to be dispensed in a liquid beverage. The separate receptacles can be manufactured and sold or stored separately from the cans, for example, at a pharmacy or hospital. It will be particularly useful for dispensing medicines to those who have difficulty swallowing pills.

The snap-on container cap of the present invention preferably sits on and may be used with a conventional beverage container such as a soft drink can. As shown in FIG. 1, the snap-on cap 10 has a circular disc shape, and includes a cut-out 12 formed in a flat portion 14 thereof. The cut-out 12 is of a wedge shape to prevent interference between the cap 10 and the pour panel 50 of the container (shown in FIG. 4). Side portions 30 extend downward from the peripheral edge 11 of the flat portion 14, as shown in FIG. 2, and include one or more projections 32 projecting inwardly. A releasing lever 34 that extends outwardly from the peripheral edge 11 of the cap 10 is attached to a projection 32. Both the releasing lever 34 and the projections 32 are formed of a resilient material, such as an elastomeric or thermoplastic material.

An opening lever 16 is attached at an underside thereof to an upwardly bendable flap 25 of the flat portion 14 at or near a midpoint of the opening lever 16 proximate the cut-out 12. The

flap 25 is part of the flat portion 14 and is formed of a bendable material. The flap 25 may be pivotal with respect to the flat portion 14. As shown in FIG. 1, the opening lever 16 includes a lifting end 15 and a pointed opening end 19 opposite the lifting end 15 and may include a receptacle 17 for containing a substance 18 to be dispensed. A plunger 20 fits through a hole 21 formed in the lifting end 15 and includes a handle 22 attached to a shaft 24 attached to a pusher 26 for pushing the substance 18 to be dispensed out of the receptacle 17. The shaft 24 is formed of a non-breakable material so that the plunger 20 will not fracture if a user lifts the opening lever 16 by lifting the plunger 20. The plunger 20 slides into and out of the opening lever 16 in the A-B direction indicated in FIGS. 2 and 4. The opening end 19 of the opening lever 16 includes a hole 23 covered by a burstable material 28, such as foil, that is attached with an adhesive. The burstable material 28 itself may be covered by a protective wrap 29, such as cellophane, to keep it clean and free from contaminants. The wrap 29 is removed before the plunger 20 is activated.

According to a second embodiment, the opening lever 16 may be attached to the flat portion 14 of the container cap 10 so that it is slidable in the A-B direction of FIG. 1. For the slidable attachment, a guide 54 is provided on the underside 52 of the opening lever 16, as shown in FIG. 6. The guide 54 has a C-shaped cross-section, as shown in FIG. 7, and includes a pair of opposing upwardly oriented side rails 56, 56 that define a groove 55. In FIG. 8, the opening lever 16 is shown attached to the container cap 10 according to the embodiment of the present

invention. As illustrated, the container cap 10 includes a bendable flap 51 comprised of a base section 57 that may be pivotally attached to the flat portion 14 of the container cap 10 and an upwardly bendable section 58. The width of the bendable section 58 is less than the width of the groove 55, as shown in FIG. 9, so that the bendable section 58 fits in the groove 55 and is held therein by the lips 53, 53 of the side rails 56, 56. The end of the bendable section 58 includes extensions 59, 59 projecting from either side to ensure that the opening lever 16 remains attached to the container cap 10 and does not slide off. The length of the bendable section 58 of the flap 51 is greater than the length of the guide 54 so that the opening lever 16 is translatable with respect to the container cap 10 in the A-B direction. This arrangement enables a user to move the opening end 19 of the opening lever 16 away from the pour panel 50 of the container 40 after the substance 18 has been dispensed so that the beverage 48 can be more easily drunk without interference from the opening lever 16.

In order to discourage a user from lifting the plunger 120, the lifting end 115 of the opening lever 116 can be displaced from the upper surface of the flat portion 114 of the snap-on cap 110, as shown in FIGS. 3A and 3B. According to this modification of the first and second embodiments, the upper surface of the opening lever 116 slopes upwardly from an opening end 119 to the lifting end 115 so that a gap 112 is formed between the underside of the lever 116 and the upper surface of the flat portion 114. This configuration, which resembles an inverted U-shape in cross-section as shown in in FIG. 3B, enables a user to insert a

fingertip in the gap 112 to facilitate a lifting of the opening lever 116. In this case, the shaft 124 of the plunger 120 is sufficiently bendable so as to conform to the changing shape of the receptacle 117 as the plunger 120 is pushed in.

An operation of the present invention according to these embodiments will now be described with reference to FIG. 4. The snap-on cap 10 is snapped onto a conventional beverage container 40, such as a carbonated or non-carbonated soft drink, fruit juice, mixer, sports drink, water or other appropriate or applicable liquid container, with an easy-to-open retainer tab on its top end. The beverage container 40 is formed of a top 42, a bottom 44, and a sidewall 46. The bottom 44 may be formed as an integral part of the sidewall 46 or it may be attached thereto separately. The container 40 may be cylindrical in shape and contains a beverage 48 to be consumed by a user. The snap-on cap 10 is attached to the container 40, and the projections 32 of the side portions 30 abut and frictionally grip the sidewall 46 of the container 40. The top 42 of the container 40 has a pour panel 50 that is openable and non-resealable. The pour panel 50 is opened by lifting the lifting end 15 of the opening lever 16, which causes the opening end 19 of the opening lever 16 to move downward to break open the pour panel 50 on the container 40. To release the substance 18 from the opening lever 16, the plunger 20 is pushed in the B direction of FIG. 4, thereby compressing the substance 18 and causing the burstable material 28 on the opening end 19 of the opening lever 16 to burst open and empty its contents through the hole 23 into the container 40. If the opening lever 16 is provided with a protectible wrap 29,

the wrap 29 is removed before the plunger 20 is activated. The mixed beverage can then be consumed from the container without having to remove the snap-on cap 10. Additionally, according to the second embodiment described above, the opening lever 16 may be slid away from the area of the pour panel 50 so as not to interfere with consumption or pouring of the beverage from the container 40. Alternatively, the snap-on cap 10 can be easily removed by lifting the releasing lever 34, thereby causing the projections 32 to elastically release from engagement with the sidewall 46 of the beverage container 40. These embodiments of the present invention are particularly convenient, therefore, for administering medication to those too young or otherwise unable to swallow or chew tablets.

As shown in FIGS. 1-4, the length of the opening lever 16 may be such that the opening lever 16 does not extend beyond the peripheral edge 11 of the cap 10. Alternatively, as shown in FIG. 5, the opening lever 102 may extend beyond the peripheral edge 104 of the container cap 106 to facilitate the lifting of the opening lever 102. In such a case, it becomes unnecessary for the lifting end to be formed in an inverted U-shape so as to be displaced from the upper surface of the flat portion 114 of the container cap 110, as shown in FIGS. 3A and 3B.

As an alternative third embodiment, shown in FIG. 10, the opening lever 16 including the receptacle 17 can be attached directly to the top 42 of the container 40 without the need for a detachable container cap 10. According to such a construction, the bendable flap 25a is attached directly to the top 42 of the container 40 and to the underside of the opening lever 16. Thus,

the lever 16 can be readily adapted to existing canning techniques.

According to a fourth embodiment of the present invention (shown in FIG. 11), a container cap 60 includes a disc-shaped flat portion 64 with a wedge-shaped cut-out 66 and an opening lever 62 attached to the flat portion 64 proximate the cut-out 66. The opening lever 62 is secured by an upwardly bendable flap 25 that is attached to the flat portion 64 and to the underside 68 of the opening lever 62. The opening lever 62 does not include a receptacle and, thus, does not contain a substance to be dispensed. Rather, lifting the opening lever 62 solely opens the pour panel 50 of the container 40 shown in FIG. 4. As shown in FIGS. 12 and 13, the opening lever 62 is displaced from the upper surface of the flat portion 64 at an opening end 65 thereof to enable one to easily insert a fingertip in the gap 63 formed beneath the opening lever 62 to open a container without damaging one's fingernails. The opening end 65 has an inverted U-shaped cross-section, as shown in FIG. 13, with the gap 63 being formed between an underside of the opening lever 62 and the upper surface of the flat portion 64.

As shown in FIGS. 11, 12 and 13, the length of the opening lever 62 may be such that the opening lever 62 does not extend beyond the peripheral edge 61 of the cap 60. Alternatively, as shown in FIG. 14, the opening lever 162 may extend beyond the peripheral edge 161 of the container cap 160. In such a case, it becomes unnecessary for the lifting end to be formed in an inverted U-shape so as to be displaced from the upper surface of the flat portion of the container cap.

A fifth embodiment of the present invention, illustrated in FIGS. 15, 16 and 17, is a container cap 70 for use in conjunction or combination with a conventional beverage container such as a soft drink can 40, wherein the receptacle is not defined by the lever but rather is attached to the underside of the cap 70. Referring to FIG. 17, the snap-on cap 70 has a circular disc shape, and includes a wedge-shaped cut-out 72 formed in a flat portion 74 thereof. Side portions 76 extend downward from the peripheral edge 71 of the flat portion 74, as shown in FIG. 15. An opening lever 78 is attached to the flat portion 74 proximate the cut-out 72. The opening lever 78 includes a lifting end 77 and a pointed opening end 79 opposite the lifting end 77. Similar to previous embodiments, although not shown, the lifting end 77 may extend beyond the peripheral edge 71 of the container cap 70. Likewise, similar to previous embodiments, although not shown, the lifting end 77 may be formed in an inverted U-shaped so as to be displaced from the upper surface of the flat portion 74 to form a gap to facilitate lifting of the opening lever without breaking one's fingernails (as shown in FIGS. 12 and 13).

A receptacle 80 for containing a substance 82 to be dispensed is attached to an underside of the flat portion 74 at a position corresponding to the cut-out 72 and opposing the opening end 79 of the opening lever 78. The receptacle 80 is formed of a tearable or burstable material, such as foil, a plastic sheet or a combination thereof. Unlike the previous embodiments, however, an underside of the flat portion 74 is spaced apart from the top 42 of the container 40 so as to define a gap 75 that accommodates the receptacle 80, as shown in FIG.

16. When the lifting end 77 of the opening lever 78 is lifted, the opening end 79 tears through the receptacle 80, thereby releasing the substance 82 into a beverage contained in the container. The opening lever 78 can simultaneously open the receptacle 80 and the pour panel 50 of the container 40, or the pour panel 50 of the container 40 can be opened by another means prior to attaching the container cap 70 thereto.

Other embodiments of the present invention relating to the separate ingredient dispenser, which can be manufactured, sold and stored apart from the container, can be understood with reference to FIGS. 18-22, which present various views of several embodiments of the ingredient dispenser for use in conjunction or combination with a conventional beverage container such as a soft drink can, as shown in FIGS. 18 and 19. The beverage container 210 is formed of a retain tab top 213, a bottom 205, which may be an integral part of the top 213 or attached separately, and a body or sidewall 207. The container 210 is cylindrical in shape and contains a beverage 209 to be consumed by a user. The beverage 209 could be a carbonated or non-carbonated soft drink, fruit juice, mixer, sport drink, water, or other appropriate or applicable liquid, for example. The top 213 of the container 210 has a pour panel 215 that is openable and non-resealable. The pour panel 215 is opened with an opener tab 300 attached to the upper side of the top 213 of the container 210.

According to a first embodiment of the present invention shown in FIGS. 18 and 19, a dispensing apparatus includes a receptacle 290 (preferably in the shape of a flat right cylinder)

attached to an underside of the top 213 of the container 210. The receptacle 290 includes unbreakable sidewalls 292 and a breakable bottom 294 and is formed or affixed during the manufacture of the can top 213. The top 296 of the receptacle 290 is deformable, unbreakable material that covers a hole 298 formed in the top 213 of the container 210. The top 296 may also include an optional pin 295 or other piercing object projecting downward from an underside of the top 296 into the receptacle 290 to facilitate puncturing the bottom 294, which is also scored or otherwise manufactured to burst downward upon application of pressure upon the top 296 of the receptacle 290. The space defined by the bottom 294, the sidewalls 292 and the top 296 of the receptacle 290 contains a solid or liquid substance 222 to be dispensed in the liquid beverage 209 contained in the container 210.

An opener tab 300 having an elongated breaking end 302 opposite a lifting end 304 is attached to the top 213 of the container 210 for dispensing the substance 222 and for opening the pour panel 215 of the container 210. The opener tab 300 is rotatable about point B in Fig. 18.

Referring still to FIGS. 18 and 19, the operation of this embodiment can be understood. Prior to opening the pour panel 215 of the top 213 of the container 210, the user rotates the opener tab 300 about the point B (clockwise in FIG. 18) so that the breaking end 302 is aligned with the top 296 of the receptacle 290. The user then lifts the lifting end 304 of the opener tab 300 causing the breaking end 302 to move downward, thereby depressing the top 296 of the receptacle 290. Upon such

depression, the substance 222 in the receptacle 290 is compressed, causing the bottom 294 of the receptacle 290 to break open, releasing the substance 222 into the liquid beverage 209 contained in the container 210. Alternatively, the depression of the top 296 causes the pin 295 to move downward, thereby puncturing the bottom 294 of the receptacle 290 and releasing the substance 222 in the liquid beverage 209. The depression of the top 296 of the receptacle 290 activates an indicator 299 formed in the top 296 of the receptacle 290 to indicate that the substance 222 has been dispensed.

The user then rotates the opener tab 300 in the opposite direction about point B (counterclockwise in FIG. 18) so that the breaking end 302 is aligned with the pour panel 215 formed in the top 213 of the container 210. The user then lifts the lifting end 304 of the opener tab 300 causing the breaking end 302 to move downward, thereby breaking open the pour panel 215 of the top 213 of the container 210. Once the pour panel 215 has been broken open, the beverage 209 that has been mixed with the substance 222 can be drunk or poured.

Another embodiment of the present invention illustrated in FIGS. 20 and 21 includes a container 210a with a well 310 attached to an underside of the top 213 of the container 210. The well 310 of the present embodiment is preferably shaped similarly to the receptacle 290 in the previous embodiment, including unbreakable sidewalls 312 and a breakable bottom 314 manufactured in a manner so that upon the breaking of a seal in the bottom of the well 310 the substance to be dispensed is released downward, as described hereinafter. The sidewalls 312

of the well 310 may include a circumferential slot 315.

The well 310 may or may not include a top. If it does include a top, as shown in FIG. 20, the top 306 should peel back easily to protect the cleanliness of the well 310 during storage. Otherwise, the embodiment does not differ significantly from the one depicted in FIGS. 18 and 19, and is upwardly open at the hole 298 formed in the top 213 of the container 210. The shape of the well 310 can be cylindrical to accommodate a cylindrical substance dispenser 330, shown in Fig. 22. The substance dispenser 330 includes an unbreakable, deformable top 334, an unbreakable sidewall 332, and a scored burstable bottom 336. The outer diameter of the substance dispenser 330 is substantially equal to the inner diameter of the well 310 so that when the dispenser 330 is inserted in the well 310, it fits tightly and will not become dislodged. Alternatively, the sidewall 332 of the dispenser 330 may include a circumferentially projecting lock rim 338 that fits in the slot 315 formed in the sidewall 312 of the well 310. This feature ensures that the dispenser 330 will securely lock into the well 310 upon insertion therein and will not become dislodged. These embodiments makes it possible to add medicine to the receptacle after the container 210 has been manufactured and, thus, enables the container 210a to be sold separately from the dispenser 330, including in drugstores.

Operation of the dispensing apparatus according to this embodiment is quite similar to the operation of the preceding embodiment, except that first, the user must insert the dispenser 330 through the hole 298 formed in the top 213 of the container 210a and into the well 310, with the breakable bottom 336 of the

dispenser 330 abutting the breakable bottom 314 of the well 310. The user then rotates the opener tab 300 about the point B (clockwise in Fig. 20) so that the breaking end 302 is aligned with the top 334 of the dispenser 330. The user then lifts the lifting end 304 of the opener tab 300 causing the breaking end 302 to move downward, thereby depressing the top 334 of the dispenser 330. Upon such depression, the substance in the dispenser 330 is compressed, causing the bottom 336 of the dispenser 330 and, simultaneously, the bottom 314 of the well 310 to break open and the substance is released in the liquid beverage 209 contained in the container 210.

The user then rotates the opener tab 300 in the opposite direction about point B so that the breaking end 302 is aligned with the pour panel 215 formed in the top 213 of the container 210. The user then lifts the lifting end 304 of the opener tab 300 causing the breaking end 302 to move downward, thereby breaking open the pour panel 215 of the top 213 of the container 210. Once the pour panel 215 has been broken open, the beverage 209 that has been mixed with the substance 222 can be drunk.

In these last two embodiments, it may not be necessary to rotate the opening tab to effect release of the substance in the receptacle, but rather simply to use manual pressure.

Although the various embodiments of the subject invention have been disclosed and illustrated with reference to application of the dispensing apparatus to an aluminum beverage can, it should be apparent to a person of ordinary skill in the art that the dispensing apparatuses herein disclosed can be modified and adapted without departing from the scope of the present

invention. They can be, for example, applied to other types of containers, such as bottles. Having described specific preferred embodiments of the present invention with reference to the accompanying drawings, it is to be understood that the invention is not limited to those precise embodiments, and that various changes and modifications may be effected therein by one skilled in the art without departing from the spirit or the scope of the present invention as defined in the appended claims.

WHAT IS CLAIMED IS:

1. A container cap for a beverage container having a top and a non-resealable opening pour panel included in the top, the container cap comprising:

a flat portion extending partially around an edge of the beverage container so as to define a container cap having a cut-out;

side portions extending downward from the flat portion of the container cap; and

an opening lever attached to the container cap, the opening lever including a first end and a second end extending partially across the cut-out, wherein the opening lever is attached to the flat portion of the container cap at a point between the first end and the second end proximate the cut-out.

2. A container cap according to claim 1, wherein the cut-out is wedge-shaped.

3. A container cap according to claim 1, further comprising projections projecting inwardly from an inner surface of the side portions, said projections for gripping the container.

4. A container cap according to claim 3, further comprising a releasing lever extending outward from the projections at an acute angle relative to a side of the container.

5. A container cap according to claim 1, wherein the container cap is mounted on the top of the container so that the second end of the opening lever opposes the non-resealable opening pour panel on the top of the container.

6. A container cap according to claim 1, wherein the second end of the opening lever is pointed.

7. A container cap according to claim 1, wherein the opening lever includes a receptacle for containing a substance to be dispensed in a beverage contained in the beverage container.

8. A container cap according to claim 7, wherein the second end of the opening lever includes an opening covered with a burstable material.

9. A container cap according to claim 8, wherein the burstable material is covered with a removable protective wrap.

10. A container cap according to claim 8, wherein the opening lever further comprises a plunger slidably fitted in the opening lever.

11. A container cap according to claim 10, wherein the plunger is formed of a flexible material.

12. A container cap according to claim 10, wherein the container cap is mounted on the top of the container so that when the first end of the opening lever is lifted, the second end of the opening lever moves downward, and the plunger is pushed to compress the substance contained in the receptacle to break the burstable material to dispense the substance in the beverage.

13. A container cap according to claim 5, wherein downward movement of the second end of the opening lever breaks open the pour panel in the top of the container.

14. A container cap according to claim 1, wherein the flat portion, the side portions, and the opening lever are formed of a plastic material.

15. A container cap according to claim 4, wherein the side portions, the projections, and the releasing lever are formed of an elastomeric material.

16. A container cap according to claim 1, wherein the first end of the opening lever extends beyond the edge of the beverage container.

17. A container cap according to claim 1, wherein the first end of the opening lever is formed so as to be displaced a predetermined distance from the flat portion of the container cap to form a gap between the opening lever and the flat portion.

18. A container cap according to claim 1, further comprising a receptacle formed of a burstable material attached to an underside of the flat portion and containing a substance to be dispensed.

19. A container cap according to claim 18, wherein the receptacle is attached at a position corresponding to the cut-out.

20. A container cap according to claim 19, wherein the container cap is mounted on the top of the container so that the second end of the opening lever opposes the receptacle and the pour panel of the top of the container and a downward movement of a second end of the opening lever simultaneously breaks open the receptacle and the pour panel.

21. A container cap according to claim 1, further comprising attachment means for attaching the opening lever to the container cap, the attachment means including a first part attached to the container cap and a second part slidingly attached to the opening lever so that the opening lever is slidable with respect to the container cap, wherein the attachment means is formed of a bendable material.

22. A container cap according to claim 21, wherein the opening lever includes a groove for receiving the second part of the attachment means.

23. A container cap according to claim 21, further comprising limiting means for limiting a range of sliding of the opening lever with respect to the container cap.

24. An apparatus for dispensing a substance in a beverage contained in a container comprising:

a lever defining a receptacle for containing the substance to be dispensed and including a first end and a second end;

dispensing means for dispensing the substance out of the second end of the lever; and

attachment means for attaching the lever to a top of the container, the attachment means including a base part attached to the top and an upwardly bendable part attached to the lever.

25. An apparatus according to claim 24, wherein the second end of the lever opposes a pour panel formed in the top of the container.

26. An apparatus according to claim 24, wherein the dispensing means comprises a plunger fit in an opening formed in the first end of the lever.

27. An apparatus according to claim 24, wherein the upwardly bendable part of the attachment means is slidingly attached to the lever.

28. An apparatus for dispensing a substance in a liquid beverage comprising:

a container for containing a liquid beverage including a body and a top;

a pour panel formed in the top of the container;

an opener tab rotatably attached to the top, the opener tab including a lifting end and a breaking end; and

a receptacle attached to an underside of the top and angularly displaced from the pour panel for containing a substance to be dispensed, the receptacle comprising a breakable lower portion, an unbreakable side wall, and an unbreakable upper portion, the lower portion being downwardly openable upon application of pressure to the upper portion,

wherein the substance is released into the beverage container by lifting the lifting end of the opener so that the breaking end applies a downward force on the upper portion of the receptacle to tear open the lower portion of the receptacle.

29. An apparatus according to claim 28, wherein the container is opened by rotating the opener tab to a position corresponding to the pour panel and by lifting the lifting end of the opener tab to open the pour panel.

30. An apparatus according to claim 28, further comprising piercing means on an underside of the upper portion of the receptacle to pierce the lower portion of the receptacle.

31. An apparatus according to claim 30, wherein the piercing means comprises a pin.

32. An apparatus according to claim 28, further comprising an indicator on an exterior of the container to indicate that the receptacle has been torn open.

33. An apparatus according to claim 28, wherein the container is cylindrical.

34. An apparatus for dispensing a substance in a liquid beverage comprising:

a container for containing a liquid beverage including a body and a top;

a pour panel formed in the top of the container;

an opener tab rotatably attached to the top, the opener tab including a lifting end and a breaking end; and

a receptacle attached to an underside of the top and angularly displaced from the pour panel for containing a substance to be dispensed, the receptacle comprising a breakable lower portion, an unbreakable side wall, and an unbreakable upper portion, the lower portion being downwardly openable upon application of pressure to the upper portion,

wherein the substance is released into the beverage container by manually applying a downward force on the upper portion of the receptacle to tear open the lower portion of the receptacle and the container is opened by lifting the lifting end of the opener tab so that the breaking end applies a downward force on the pour panel to break open the pour panel.

35. An apparatus for dispensing a substance in a liquid

beverage comprising:

a container for containing a liquid beverage, the container including a body and a top defining an interior;

a well formed in the top comprising a breakable lower portion and an unbreakable side wall and having an open top; and

a dispenser containing a substance to be dispensed including an unbreakable top, an unbreakable side, and a breakable lower portion, the dispenser sized to fit in the well,

wherein the dispenser is fitted in and held by the well with the lower portion facing downward, so that when pressure is applied to the top of the dispenser, the lower portion of the dispenser and the lower portion of the well break open, thereby dispensing the substance in the beverage.

36. An apparatus according to claim 35, further comprising a tab attached to a top of the container wherein the tab applies the pressure to the top of the dispenser.

37. An apparatus according to claim 35, wherein the well is adjacent an opening in the top for dispensing the beverage.

38. An apparatus according to claim 35, wherein the well is located within an opening in the top for dispensing the beverage.

39. An apparatus according to claim 35, wherein the container is cylindrical.

40. An apparatus according to claim 35, further comprising:

a slot formed in the side wall of the well; and

a lock rim protruding from the side of the dispenser, the lock rim fitting in the slot when the dispenser is inserted in the well.

FIG. 1

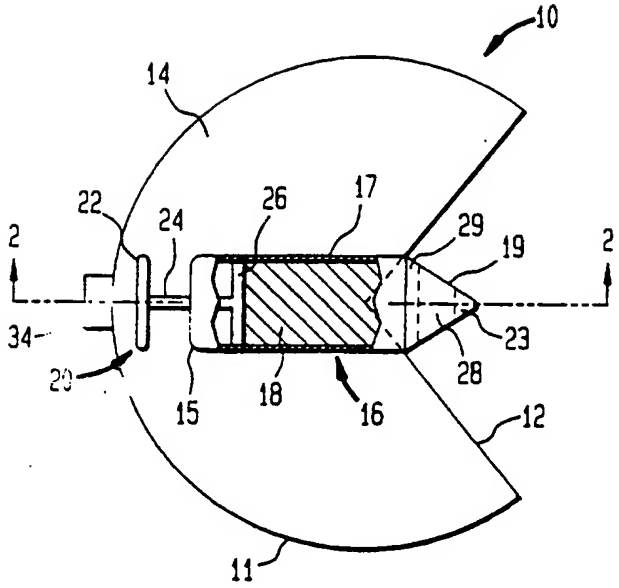

FIG. 2

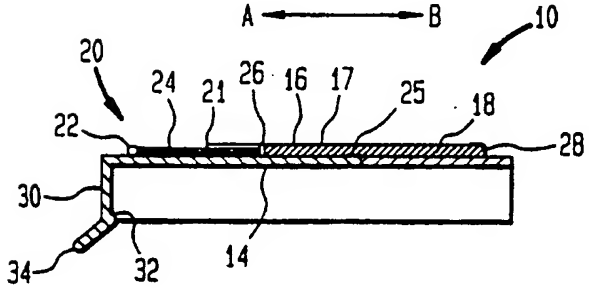

FIG. 3A

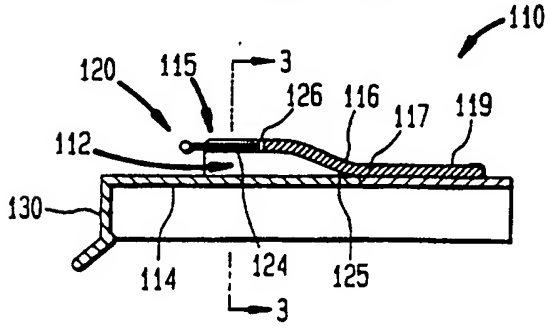

FIG. 3B

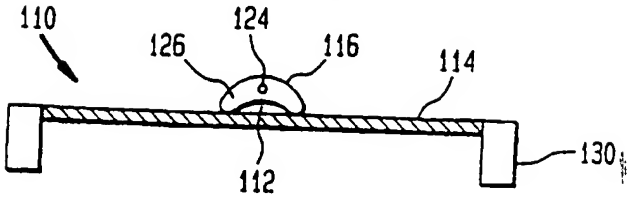
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FIG. 4

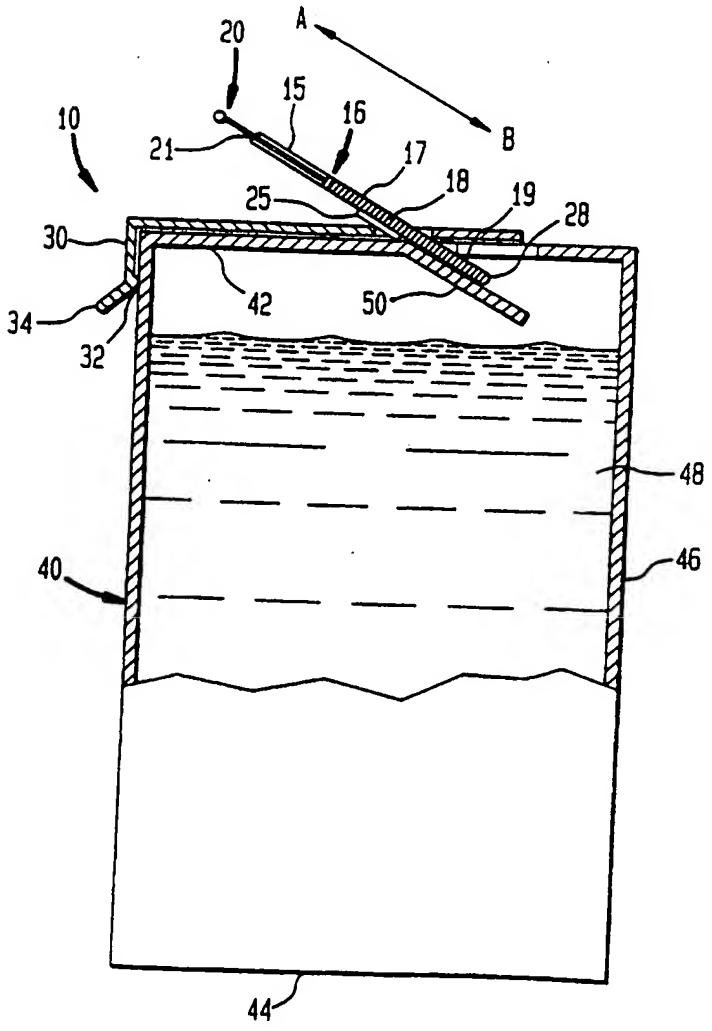
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FIG. 5

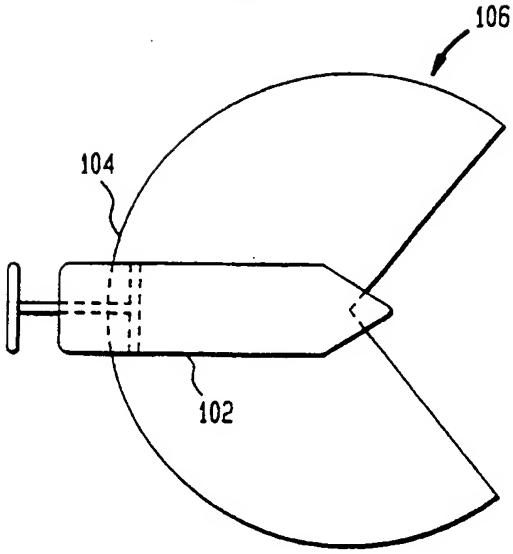

FIG. 10

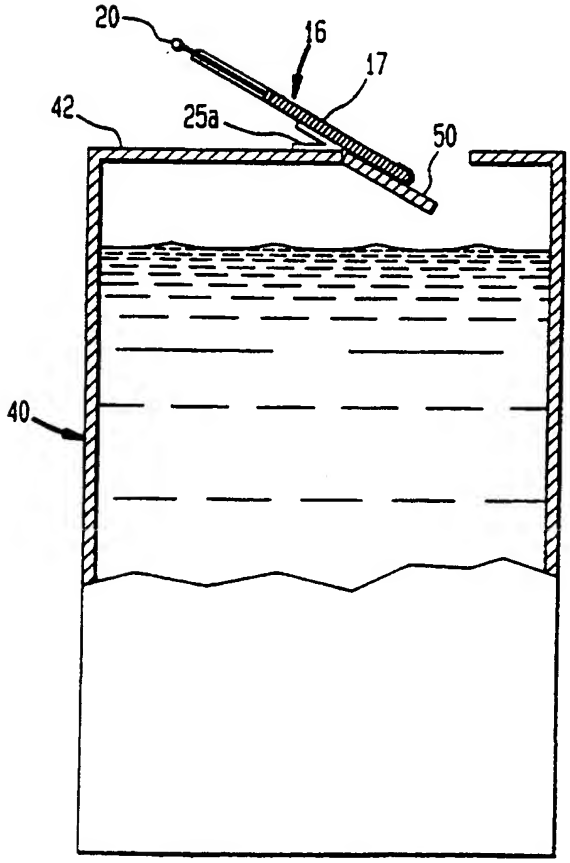

FIG. 6

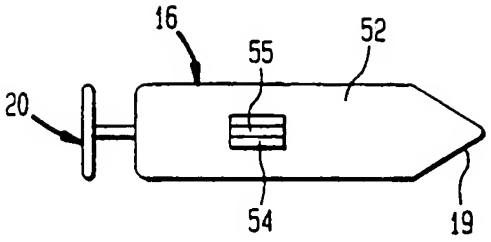

FIG. 7

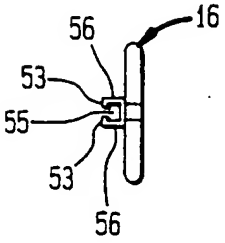

FIG. 8

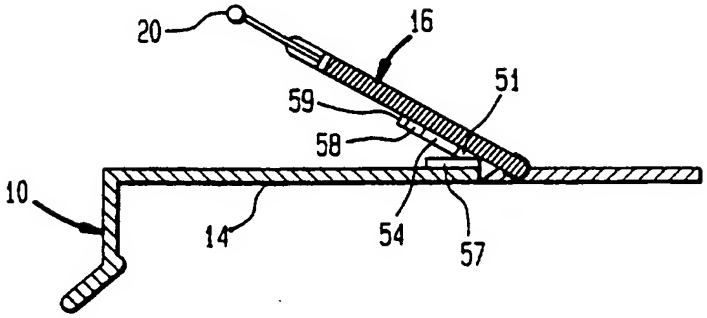

FIG. 9

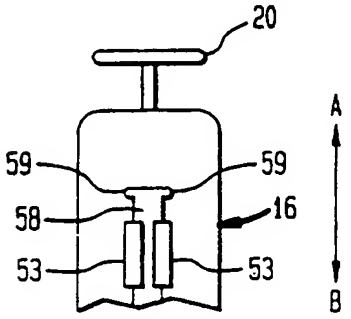

FIG. 11

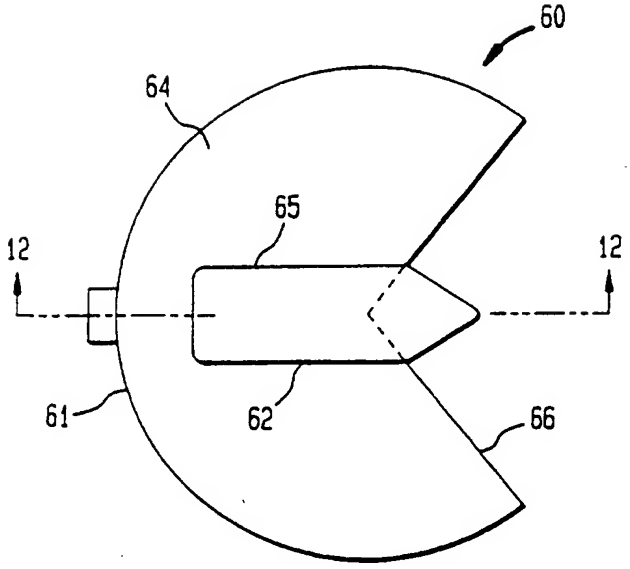

FIG. 12

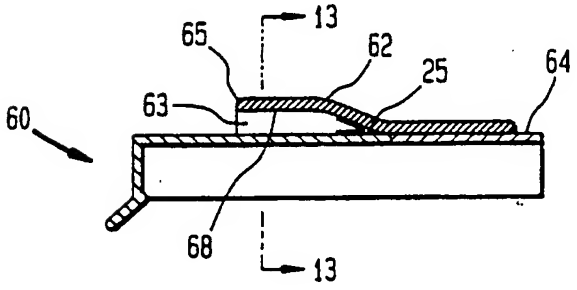

FIG. 13

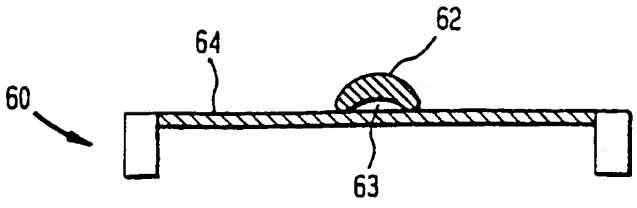

FIG. 14

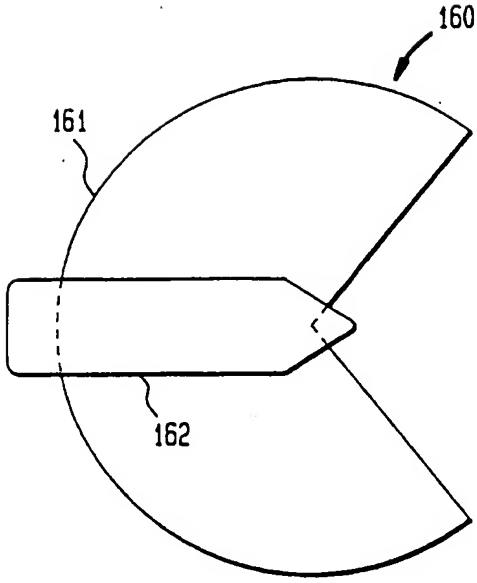

FIG. 15

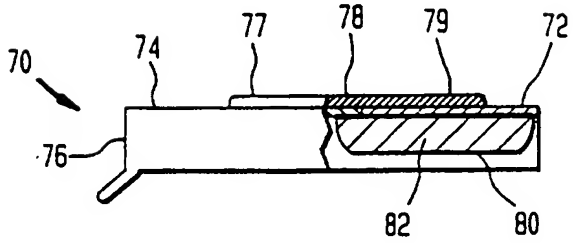

FIG. 16

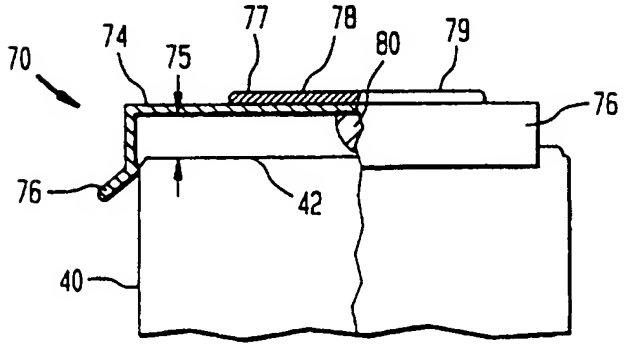

FIG. 17

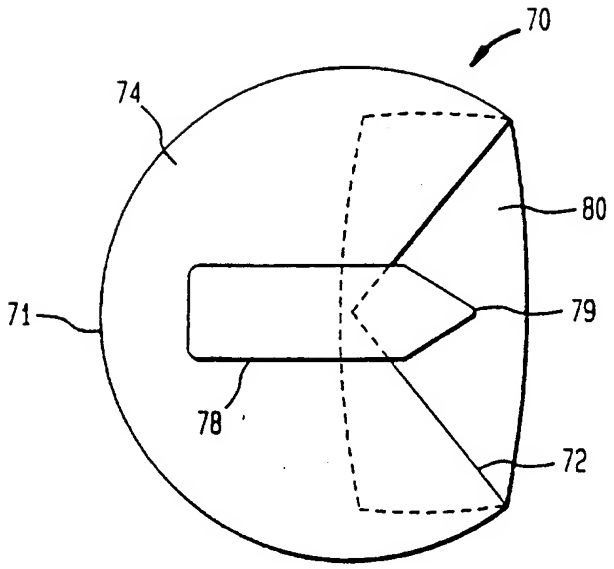

FIG. 18

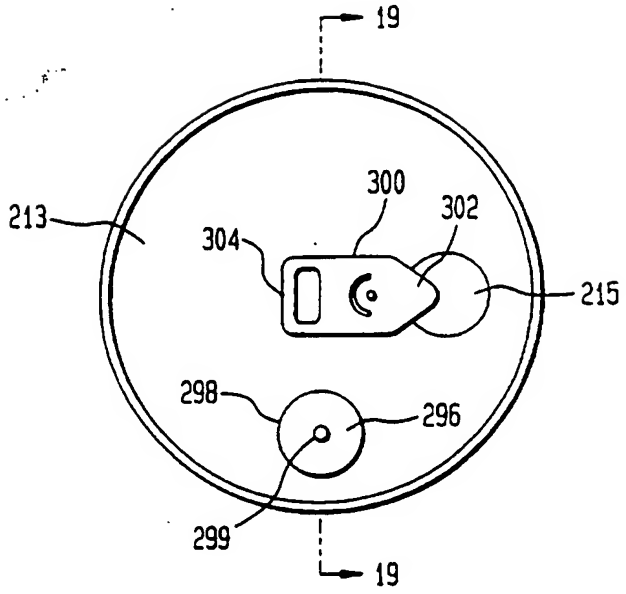
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FIG. 19

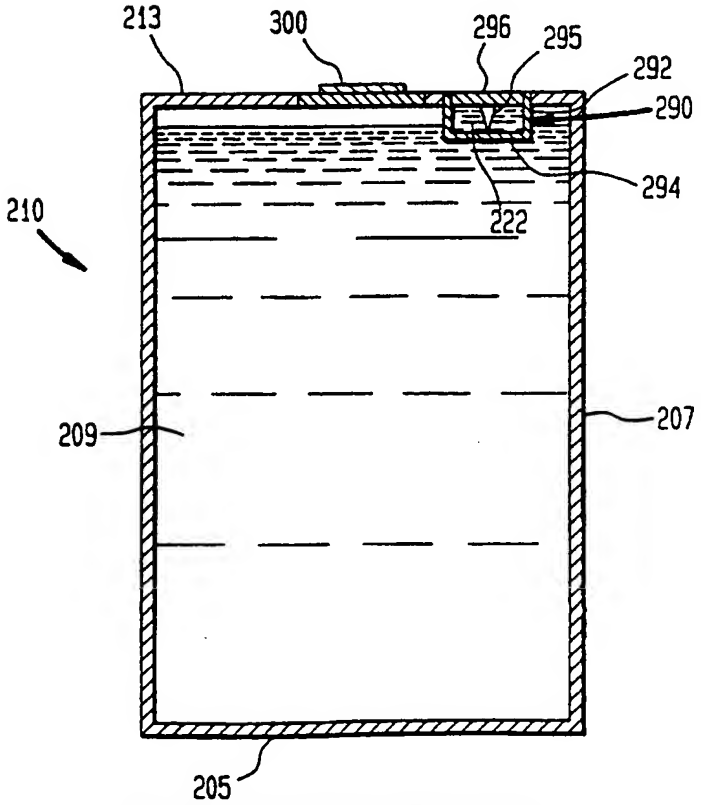
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FIG. 20

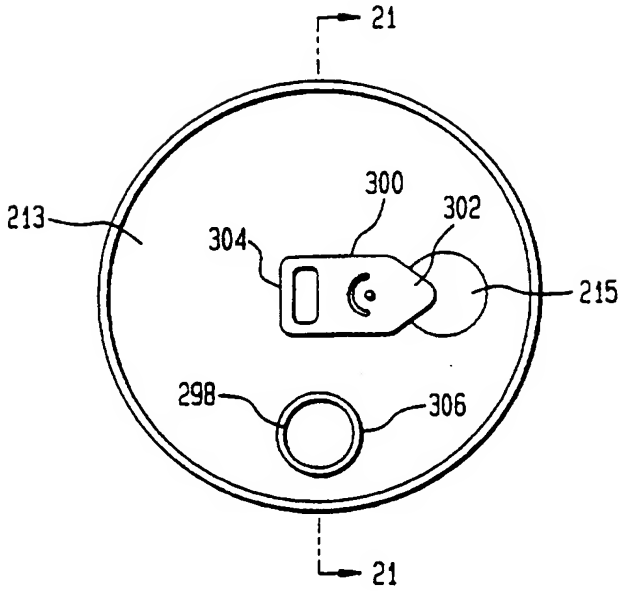


FIG. 21

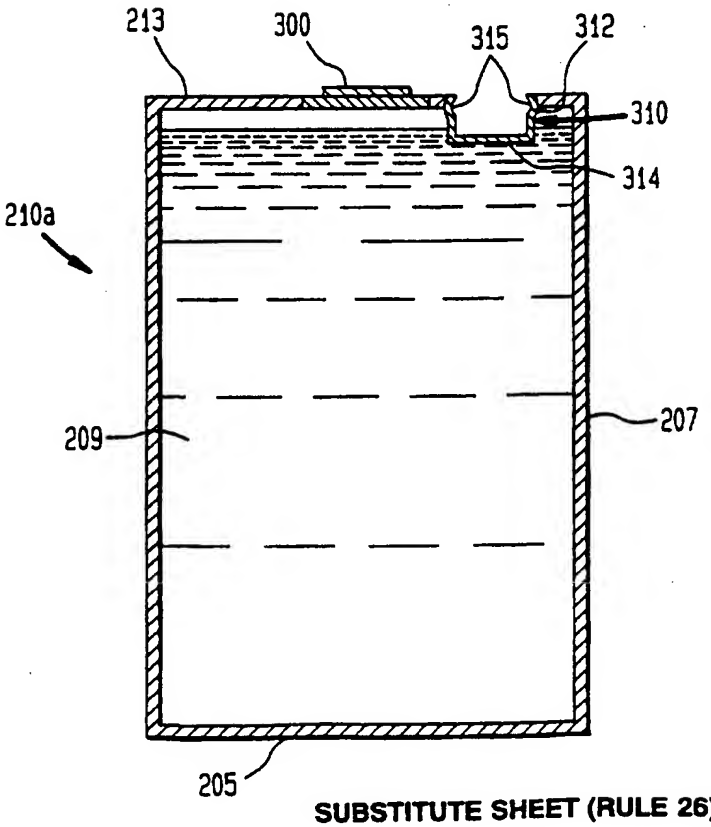
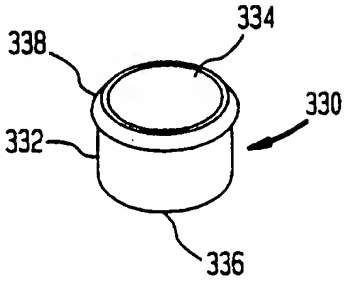


FIG. 22



INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/02538

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) :B65D 25/08, 69/00, 71/00, 77/00
US CL :206/217, 219, 222, 568; 220/258, 267
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system, followed by classification symbols)
U.S. : 206/217, 219, 222, 568; 220/258, 267

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2,821,326 A (FRIED) 28 January 1958, see figures and columns 3, 4 and 5.	1 --- 2, 5, 13, 14, 16, 17
Y	US 4,221,291 A (HUNT) 09 September 1980, col 7, lines 9-68 and col 8, lines 1-30.	3, 4, 7, 15, 18-20
Y	US 4,264,007 A (HUNT) 28 April 1981, see abstract.	3, 4, 7, 15, 18-20
Y	US 3,371,818 A (BOZEK) 05 March 1968, see column 2.	2 and 5-6

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

*	Special categories of cited documents	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A"	document defining the general state of the art which is not considered to be of particular relevance	"X"	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E"	earlier document published on or after the international filing date	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&"	document member of the same patent family
"O"	document referring to an oral disclosure, use, exhibition or other means		
"P"	document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 10 JUNE 1997	Date of mailing of the international search report 09 JUL 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer For Paul Sewell Telephone No (703) 308-2126

Sheila Veney
Paralegal Specialist
Group 3200

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/02538

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Please See Extra Sheet.

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:
1-20

Remark on Protest
☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/02538

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack Unity of Invention because they are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for more than one species to be searched, the appropriate additional search fees must be paid. The species are as follows:

Specie I: Figures 1-3A,3B,4,5
Specie II: Figures 6-9
Specie III: Figure 10
Specie IV: Figures 11-14
Specie V: Figures 15-17
Specie VI: Figures 18-19
Specie VII: Figures 20-21

The claims are deemed to correspond to the species listed above in the following manner:

Specie I: claims 1-20
Specie II: claims 21-27
Specie IV: claims 1-6 and 13-17
Specie VI: claims 28-34
Specie VII: claims 35-40

The following claims are generic: none

The species listed above do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: the special technical feature of specie I is an apparatus with a releasing lever and a receptacle for storing mixing substance. The special technical feature of specie II is the slidable attachment means. The special technical feature of specie III is an apparatus with a receptacle for storing mixing substance. The special technical feature of specie IV is an apparatus with a releasing lever. The special technical feature of specie V is the mixing substance in a receptacle beneath the top surface of the can. The technical feature of speci VI is a rotatable tab and a dispensing apparatus. The technical feature of specie VII is a removable dispenser with a lock rim. Species I-VII do not share the same special technical features, therefore, unity of invention is lacking.

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